



INVENTION DISCLOSURE

PAGE ONE OF _____

PDNO 10017384

DATE RPOD 5/21/2004

ATTORNEY BATES/KOZAK

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Descriptive Title of Invention:

Fabrication of molecular electronic circuit by imprinting

Name of Project:

Quantum structure research

Product Name or Number:

Was a description of the invention published, or are you planning to publish? If so, the date(s) and publication(s):

no

Was a product including the invention announced, offered for sale, sold, or is such activity proposed? If so, the date(s) and location(s):

no

Was the invention disclosed to anyone outside of HP, or will such disclosure occur? If so, the date(s) and name(s):

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Was the invention described in a lab book or other record? If so, please identify (lab book #, etc.):

No

Was the invention was built or tested? If so, the date:

Yes

Was this invention made under a government contract? If so, the agency and contract number:

Yes, DARPA, DOD

Description of Invention: Please preserve all records of the invention and attach additional pages for the following. Each additional page should be signed and dated by the inventor(s) and witnesses.

- A. Prior solutions and their disadvantages (if available, attach copies of product literature, technical articles, patents, etc.).
- B. Problems solved by the invention.
- C. Advantages of the invention over what has been done before.
- D. Description of the construction and operation of the invention (include appropriate schematic, block, & timing diagrams, drawings, samples, graphs, flowcharts, computer listings, test results, etc.).

Signature of Inventor(s): Pursuant to my (our) employment agreement, I (we) submit this disclosure on this date: 5/21/2004

Employee No.	Name	Signature	Title	Mailstop	Entry & Lab Name
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Employee No.	Name	Signature	Title	Mailstop	Entry & Lab Name
Employee No.	Name	Signature	Title	Mailstop	Entry & Lab Name

(If more than four inventors, include additional information on another copy of this form and attach to this document.)

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EXHIBIT NO. VALET 1

Signature of Witness(es): (Please try to obtain the signature of the person(s) to whom invention was first disclosed.)

The invention was first explained to, and understood by, me (us) on this date:

Full Name

Signature

Date of Signature

Theodore J. Kavins

Theresa D. Kavins

8/11/2001

Full Name

Signature

Date of Signature

Inventor & Home Address Information: (If more than four inventors, include add. information on a copy of this form & attach to this document.)

Inventor's Full Name

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Fabrication of molecular electronic circuit by imprinting

For nanoscale electronic circuit, it is necessary to invent new materials with the functions envisioned for them and new processes to fabricate them. Nanoscale molecules with special functions can be used as basic elements for nanoscale computing and memory applications. The imprinting method can be used to fabricate nanoscale circuits suitable for industrial fabrication process.

The imprinting method, as shown in pre art, can be used to fabricate nanoscale patterns over large area at high speed acceptable in industrial standard, and it can be used to fabricate nanoscale molecular devices, e.g. cross-bar memory circuits. A bottom electrode (#1 in Fig. 1) can be fabricated by imprinting method. The bottom electrode can be metals or semiconductors. Molecular thin films can be deposited on the top of the electrodes by self-assembled method or LB method (#2 in Fig. 1). A protective layer (metals or semiconductors, #3 in Fig. 1) can be deposited on the top of the molecular layer to avoid damage to the molecular thin films during further process. To fabricate top electrodes, a polymer layer (#4 in Fig. 2) is coated on the top of the protective layer, and patterned by imprinting method. The second electrode (#5 in Fig. 3) can be deposited and patterned by lift-off or etching method. The second electrode can be metals or semiconductors. An image of the cross-bar molecular devices fabricated with the process described above is shown in Fig. 4.

The complete molecular electronic circuit can be fabricated with more complex steps based on the imprinting process described above.

Witnessed:

J. Desrosier, D. Kaur

Thirupathi I. Kaur

5/27/2001

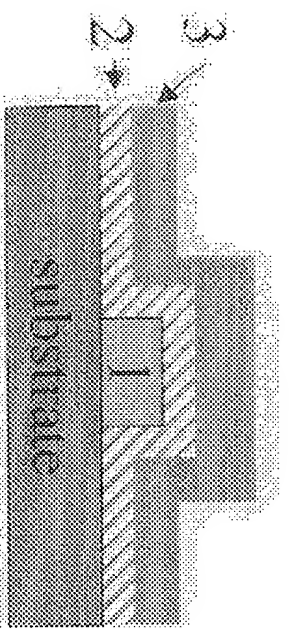


Fig. 1

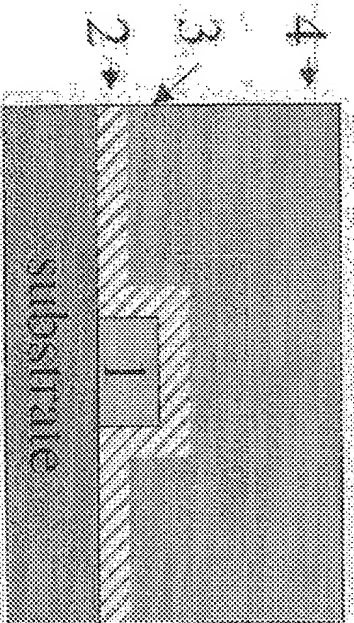


Fig. 2

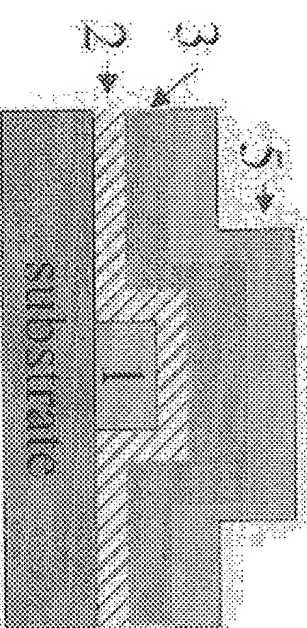
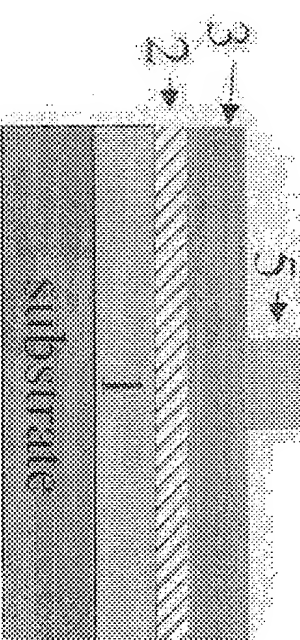
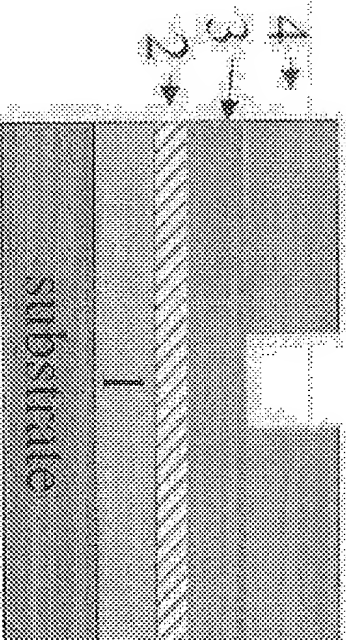
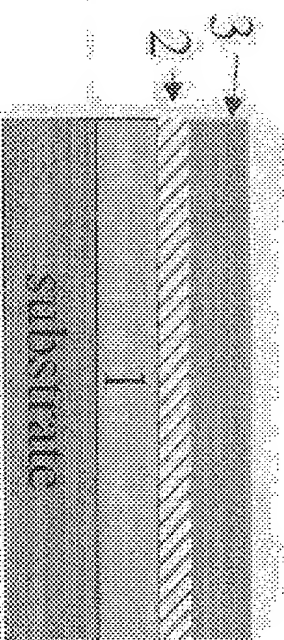
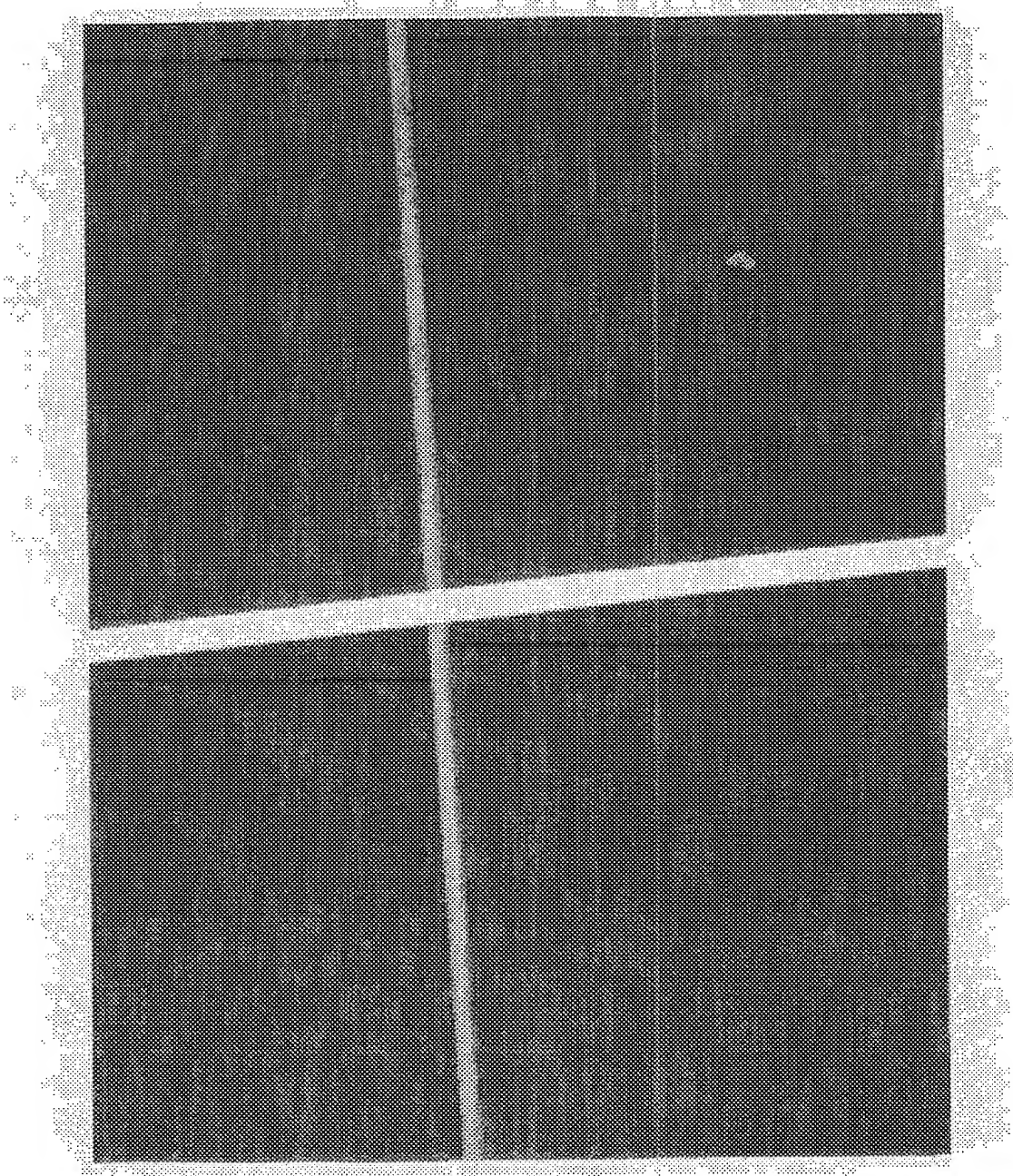


Fig. 3





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